

# A NEW APPROACH TO NEUTRAL MONISM AND THE MIND-MATTER CONTROVERSY<sup>†</sup>

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**Summary:** Neutral monism claims that both mind and matter are categories derived from a single underlying reality that is univocally identified with none of them. In this paper a theoretical outline is presented from the neutral-monism perspective on the different configurations of reality referred to as “mind” and “matter”, while also discussing its consequences and the approaches it could give raise.

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**Keywords:** Mind, matter, brain, monism, neutral, emergent, systemism, qualia

## 1. Introduction

No other certainty is rooted in us with such an overwhelming rotundity as the truth of our own self, simultaneously protagonist and spectator of the perceptions and thoughts experienced by only us on which build our singular identity. A continuous flow of experiences that we feel as something intimate and undeniable constitutes the mosaic, infinite in its complexity and perpetually unattainable, that today we are used to calling “mind” to evade the ancient denominations of “soul” or “spirit”. The identification of ours thoughts like the fundamental fabric of our own self, even more than our corporal integrity, entails an irresistible temptation. We may lose an arm, a leg or an eye but we will recognize ourselves as the same individuals without any reduction of our essential identity, our existing ego or any denomination else that can be chosen.

In open contrast with this intimate conviction that we all spontaneously share in some degree, it is obvious that we are also composed of a body, that is, something distinct of our mind that we designate with the word “matter”. Therefore, mind and matter raise as two opposite realities that are quite often defined by means of their mutual antagonism. Matter is classically characterized by appealing to a series of attributes (impenetrability, extension, position and speed, ability to interact with other portions of matter by exerting or experiencing forces, among others) which are all absent in the case of mind. The

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thoughts, lacking position or volume, are neither touchable nor susceptible of mechanical actions by means of forces.

The controversy gets more complicated insofar as there seems to be no mind without matter although the reciprocal affirmation is obviously not true; we generally admit the existence of matter without mind. Partly by an argument of analogy and partly due to politeness, most of us accept that our human partners possess minds as ours (although some behaviors might make us doubt it occasionally). Whether diverse types of higher mammals enjoy of some degree of mental life, whatever the meaning you allocate to that term, is a strongly debated topic. But nobody with a minimum of lucidity would grant mental qualities to a closet or a screwdriver. And that is the key question: we believe that our grandmother's couch does not have a mind but our grandmother does, although at a microscopic level we do not know how to really explain the difference for our own consternation and our grandmother's anger.

Most authors that over time dared to address the issue adopted one of the only two positions logically possible [Bunge 1985]: either mind and matter consists of two separate and distinct realities –although somehow linked to each other– or we admit that the apparent conflict between them is illusory as there is only one and the same existential background. The first option was chosen by the dualists, whereas the second one characterized the monist doctrine. The historical champion of the dualism was the French philosopher of the 17th century René Descartes [Martínez 1996], the one who pleaded for the existence of two disjoint substances, mental and material, between which there exists a synchrony –predetermined harmony, psychophysiologic parallelism– guaranteed by divine decree.

As time went by, Descartes acquired the doubtful honor to become for the neurophilosophers a caricatured figure which can be comfortably whacked in profit of the presently dominant theses, as Aristotle's role for the physicists and Ptolomeo's role for the astronomers. In fact, the French philosopher did his best to achieve his purposes with the means available to him and, on this view, his choice of the Pineal gland as the settlement for the mind-matter link happened to be no wilder than the election for the same goal of the supplementary motor area –at the brain top– carried out by the British scientist John Eccles in the 20th century [Eccles 1986].

The overpowering success of the empirical sciences in the human comprehension of the natural world, on the other hand, swept away the plausibility pretensions of any doctrine that was not firmly rooted in the primacy of matter. Dualism, in all its

modalities, was pushed into the superstitions' cave as an antique with mere anthropological interest, beside the animist beliefs of the pre-civilized ancient tribes. There were a still worse fate –if we can regard as such an absolute irrelevance– for the mentalist monism, the claim that the nature of reality is uniquely mental. Since its splendorous moment due to the bishop of Berkeley, in the first decade of the 18th century, that canon did not flourish any more.

Thereupon, by defeat or absence of the opponents, the ring where the mind-matter dispute was taking place seemed to be ultimately dominated by an only fighter, the materialist monism [Bunge 1981]. If there does not exist more substance than the material one, neither there will be either no other explanatory path than identifying all mental event with some cerebral event [Bunge and Ardila 1988]. Those events within brain would be based, in turn, on the behavior of the atoms that constitute neurons, a conclusion that revived again some age-old philosophical debates, as that about human free will.

The weakening of iron grip of determinism in classical physics when the quantum theory rushed in widened the limits of the controversy without touching the hard core of the problem: how can we break through the qualitatively fathomless abyss that separates my thoughts from the matter that generates them? It does not seem easy to conciliate two dimensions of the reality so radically disparate without very deep argumentations. And for this critical purpose we only have the intellectual repertoire of the materialist monism. However, perhaps it was not the only affordable option.

## **2. Neutral monism as a serious alternative**

The choice of matter as the fundamental category in our understanding of reality is a perfectly legitimate option but not necessarily superior to others. Materialism in the thresholds of the third millennium hardly keeps the least touch with the old and almost homelike features of matter as this concept was understood by the nineteenth scientists. The quantum-relativistic subtleties found out during the 20th century changed it in a frantic altarpiece of fields, waves and particles mutually entangled with one another and space-time. The classical particle solidity (for example, the electron of Lorentz and Poincaré) got dissolved in a phantasmagoric ocean of potential possibilities assessed by the corresponding wave-function.

Never before the mediated nature of our knowledge about the physical world had come to us with such an imperious rawness. The traditional notion of matter became a

logical construction –a construct– with an immense empirical support but as indirect and far apart as mind seemed to remain from matter. The causal theory of perception justifies it by means of a sequence of physical events linked to one another by cause-effect relations that have an extreme in our brain and the other one in the external world. Set aside the most rigorous idealists, there is a universal agreement on the fact that causal chains also exist when no observer is to perceive them. There are nuclear reactions within the Sun although nobody can directly perceive them, as we can expect from a universe that works without waiting for the permission of some observer. This type of causal series is ruled exclusively by physical laws.

Likewise, there are also causal chains within our brains that can be either analyzed as purely material processes ruled by biochemical and biophysical laws or alternatively regarded as mental processes subjected to psychology laws. For the materialist authors all the processes in nature are always material, obviously, and among them there are some with special properties that make necessary to use a specific adjective as “mental”.

A neutral monist claims, on the other hand, that matter does not enjoy of a particular preeminence in order to explain the nature of reality. Moreover, matter and mind would be two derivative appearances of the distinct way in which the causal series organize as frameworks that configure the real world. Analogously, by applying a criterion of vicinity to the inhabitants of a population we would cluster them in groups called “neighborhoods”, whereas by appealing to their birth year they would be split into age groups. In both cases the inhabitants are the same, the only change is the kind of relations established among them.

A previous discussion on arguments favorable to the neutral monism was already carried out [Alemañ 2012, 2013], whereby the following considerations will formally summarize the differences between the materialist and the neutral versions of the psychophysiologic monism. The materialist monism claims that any element of reality (say  $x$ ) belongs to the class of the material entities  $M$ ; that is to say, «all the real is material» involves that « $\forall x \mid x \in M$ ». Matter possesses some general properties  $P$ , such that  $xP$  means « $x$  possesses the properties denoted as  $P$ ». Nevertheless, within  $M$  there exist some  $x$  that in addition to  $P$  also possess other specific properties  $P'$  that happen to be described as “mental”. Mind, therefore, would be by definition the collection of particular functions performed by that matter with such properties  $P'$  together with the usual  $P$ . This is, « $\text{Mind} =_{\text{df}} f(x[P' \oplus P])$ », where  $f$  denotes a function in a non-rigorous sense (it does not

mean an algebraic dependency of quantifiable variables) and the symbol  $\oplus$  intends to distinguish the conjunction of properties of the mere arithmetical sum.

As opposed, neutral monism does not prioritize matter as the basic category of reality, so that it neither needs to impose to every object  $x$  its belonging to an only defining set. The main thesis is that the elements  $x$ , in virtue of some relations  $R$  that can be established among them, form orderly series that receive the name of “material” and, in turn, some other relations  $R'$  constitute different orderly series called “mental”. Insofar as  $R'$  always appear in conjunction with  $R$  (if there are  $R'$  we always find that there are also  $R' \oplus R$ ), but not the other way round, it is appropriate to define matter and mind as pairs of collections of  $x$  and the groups of the relations among them. Symbolically,  $\langle\langle \text{Matter} =_{\text{df}} \langle C(x), C(R) \rangle \rangle\rangle$  and  $\langle\langle \text{Mind} =_{\text{df}} \langle C(x), C(R' \oplus R) \rangle \rangle\rangle$ .

Since the relations  $R$  (ruled by the laws of physics) are unavoidable and occasionally confluent with the relations  $R'$  (subjected to the laws of psychology), neutral monism happens to be essentially a systemic theory in its very foundations. Every  $x$ —whose intimate nature will be discussed later—relates with others, either by means of only  $R$  or by means of  $R'$  and  $R$ . In other words, there are no  $x$  lacking of any relation. Constructed that way, the categories of mind and matter can reclaim for themselves all the powerful tools of the emergentist-systemist metaphysics. The emergent properties that appear in any system complex enough receive then the same treatment that would obtain from the perspective of the materialist monism [Bunge 2014].

Now it is the moment to face two objections usually formulated against this approach. One of them questions the ultimate legitimacy of the word “monism” because that concept would seem to compel us to exceed what reason and experiences authorize us to distinguish. How can we know whether mind and matter derive from a unique basic principle or from several ones? How can we decide whether neutral monism is truly monist or not? The most obvious answer is that all unifying theory stipulates, by explicit construction, the quantity of basic elements which phenomena to unify must remit to; then, the trial of experience is the only instance that finally determines its validity.

An outstanding example comes from the celebrated success of the unification based on a new physical entity—the electromagnetic field—that gathered electricity and magnetism. The fundamental character of this field does not posit but conjectured as a roughly true hypothesis, and if the empirical testing backs it we provisionally accept that conjecture until finding out a wider and deeper theory.

Neutral monism –and any monism indeed– proceeds equally: after formulating a unifying hypothesis on the nature of mind and matter, it tries to enquire its internal consistency, coherence with the consolidated scientific knowledge and fertility of the new raised perspectives. In this context, reason and experience do allow us to settle the legitimacy of such a theory. With the same argument we could also admonish to the materialist –or the mentalist– because they neither have certainty that the material substance –or the mental one– was a single one and not a collection of them. Returning to the comparison with the empirical sciences, nobody is used to speculate with the existence of physical entities distinct to the electromagnetic field as the real background of the electrical and magnetic phenomena. Neither the electrodynamics equations (classical or quantum) nor the experimental measurements that confirm them authorize us to this. To hold on to this multiplicity would be a choice empirically empty and rationally misguided.

The second objection accuses neutral monism of appropriating most of the concepts and argumentations of the materialist philosophers, without paying the lowest intellectual toll in return. It is an expected but unfounded counterclaim as long as any ontological reduction involves to subsume the theories subject to reduction, with all his conceptual and methodological baggage, to the most general theory that covers them. If vast areas of materialist monism get included by immersion in the neutral monism view, it seems logical that all the related methods and constructs have the same fate. Although we can discuss the merits of the beneficiary, we should not confuse the inheritance with the larceny.

### **3. On explanations and limits**

Before sketching out some theoretical profiles of the neutral monism, there may legitimately raise the question on the intrinsic limitations of our methods and formalisms in relation to subject we are to tackle. That is to say, We will come across insurmountable borders when pursuing a scientific explanation of mind and, therefore, in all monist view of mind and matter? Focusing on a crucial feature of mind –consciousness– that is the question bravely addressed by Juan Arana, Professor of Natural Philosophy at the University of Sevilla (Spain), in his outstanding book *La Conciencia Inexplicada*\* (Arana 2015). This leading work has the rare virtue of outlining with exquisite accuracy the

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\* *The Unexplained Consciousness*. There is not an English version yet.

pivotal problem from which the book takes its title, captivating to the reader with his eloquence and deployment of erudition, although in this regard there should be done some remarks that will clear the content of the following sections.

In the first place, we are not to confuse unnotedly the naturalistic explanation with another one based on physicalism, that is to say, an explanation in which all its terms have to refer, in principle, to fundamental physics. This latter sense seems to be accepted by Arana when he admits that in the naturalistic explanation of mind procedures of sciences like the psychology should participate but always under the assumption that they could be entirely reduced to physical laws (*Ibid.*, p. 132).

From the sistemist point of view, the physical world occurs in distinct levels of complexity, each one of which engenders emergent properties that prevent a complete reduction of the laws of any level to the ones of the inferior level. In other words, the systemic emergency is an ontologically innovative operation that entirely discards the most radical version of reductionism. Therefore we can expect neither the laws of psychology to be completely reduced to the laws of biology, nor the laws of biology to the ones of physics, and the aforesaid hope of Arana turns to be impossible.

That subtly breath of strict reductionism that enfolds the text resurge again when the mentioned author claims that the protruding progress of physics in the 20th century confirmed the most basic rank of the probabilistic laws, whereas the deterministic ones «(...) constitute limit cases referred to special circumstances, (...)» (*Ibid.*, 158). All those who think that the macroscopic world arises as an average on a large scale of the quantum<sup>1</sup> microsystems would subscribe this sentence, and they all would be equally unfounded –as the never-ending misfortunes of the Schrodinger’s cat show us– because we are still very far from understanding the transition between the quantum and the classical physics (Penrose 2006, 1049 *et seq.*). Moreover, neither it is true that all the quantum laws are probabilistic, as the continuous and deterministic evolution of the equation of Schroedinger puts forwards (*Ibíd.*, 711 *et seq.*).

Admitting the emergentist approach, in which some systems can possess properties that are absent from their components, consciousness would correspond to one of these emergent specificities, typical of some very peculiar biosystems. If we distinguish between “consciousness” and “mind”, it would be properly asserted that higher vertebrates with a sufficiently developed neural system have mind, although

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<sup>1</sup> Something like this could be stated for the Erhenfest equations, but only because such equations do collect limit cases referred to special circumstances.

consciousness was only enjoyed –as far as we now reach to know– by the human beings. Machines neither possess minds nor consciousness, despite the protests of the specialists in artificial intelligence<sup>2</sup>, something which Arana agrees on (*op. cit.*, 151 *et seq.*).

Because of the importance that this topic will acquire later, the following fragment is worth commenting:

“(...) Physics itself had discredited the idea that *the energy was a transcendental property of being*. Moreover, it is not even a univocal property of matter, (...), as it is expressed by Heisenberg’s second relation of indetermination, the imprecision in its value is correlated with the imprecision in time location, and the product of the error intervals when measuring both magnitudes is always greater than a fixed quantity.” (*Ibid.*, 168)

Set aside that Heisenberg’s inequalities –as any other fundamental concept of physics– do not refer to measure operations or their error intervals, it is a widespread mistake to accept the existence of a Heisenberg’s inequality for time and energy [Alemañ 2010, Bunge 1982, Gillespie 1976]. In spite of the statements exposed in a number of books, in the quantum theory time is a classical variable without dispersion –as it was properly pointed out by Dirac– and energy is strictly conserved in all process, classical or quantum, as the theorems of Noether<sup>3</sup> tell us. In fact, the only dispute in which Bohr happened to be clearly defeated by Einstein occurred when the Danish physicist defended the merely statistical conservation of energy [Pais 1984, 418 *et seq.*].

Arana’s book shows reaches the top when arriving at the core problem by asserting that consciousness is impossible to be fully explained in a fundamental level, insofar as the cognitive subjects cannot take themselves as objects of knowledge without going into an insurmountable contradiction [Arana *op. cit.*, 135 *et seq.*]. In brief, to explain the (self-)consciousness –the acknowledgment of ourselves and our surroundings– would demand to convert the subjectivity in objectivity, emptying of sense the very inquiry and snatching us what we try to explain. This paradox, raised in the middle of our path as an invincible obstacle, is due to the self-awareness, such a distinctive ability of the human mind and source of so many doubts on the possibility to explain the consciousness from its own grounds.

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<sup>2</sup> In this regard I do really think that the abyss between the syntax and semantics (Fetzer 1991) is as wide and deep as to prevent Searle’s “Chinese room” from any criticism.

<sup>3</sup> This so-named “fourth inequality of Heisenberg” was really introduced by Bohr. Bunge [1967, 267-268] mentioned that detail and called it a *pseudo-theorem*.



Conversely, on the neutral-monism view it would have to be added that this limitation involves the impossibility to derive the subject from the object, the purely internal subjectivity of mind splitting of the merely external objectivity of matter, as the genial metaphor of the Leibniz's mill expresses [Leibniz 2001, 109]. After all, with regards to consciousness the systemist emergentism displays a description rather than an explanation. That is –and will be– the case as long as we lack of a plausible mechanism to provide a genuine justification of what is called “consciousness”. It could be hardly different because any mechanism is, definitely, a causal process that concerns to one or more material system. But when facing the consciousness problem we are dealing with mind, not with matter, although this observation should not be regarded as a dualist claim. It is a reminder that we are working on two conceptual levels that must not be confused.

In the commented work some paragraphs invite us to think that Arana seems to embrace a soft version of neutral monism [*op. cit.*, 168]: “The idea of *neutral monism* could be here of great utility if we achieved to decouple it of the category of *substance* (...)”. Later on the author added [*Id.*, 176]: “The only explanation is that *soma* and consciousness are distinct but inseparable appearances of one and only reality”. And once again he reiterated [*Id.*, 192]: “I do not see any problem if both things [mind and matter] correspond to an only substance (...)”.

To accept that a fully complete explanation of consciousness is impossible by its own nature does not compel us to reject partial explanations for some of its appearances. This is the challenge, in fact, neurophilosophy has to cope with: the attempt to explore the borders of our capacity of explanation for consciousness with the hope to find perhaps some fissure that at least allows us to peep at what there is on the other side.

#### **4. Initial assumptions**

Any philosophical speculation that aims at a minimum of plausibility has to be at least compatible with the general background of the scientific knowledge consolidated to date. And it should be also introduced by means of an abstract formalism that to make them as clear and understandable as possible, so that they remain exposed to criticism. This is the strategy that will be chosen from now on in order to construe a viable theory of the neutral monism. The initial suppositions that will be assumed do not intend at all to predetermine the results of the discussion, but delimit the terrain in which the controversy will take place. Therefore we will begin by stipulating a principle of natural legality as

the ontological hypothesis stating that all the extant in nature obeys some type of law, pattern or regularity.

We will also accept the validity—at least in a provisional and approximate sense—of the laws of physics and psychology. But we will not enter to argue here whether psychological laws are really such (Teigen 2002, Leitgeb 2004) or they are only rules and tendencies. As well the emergent character of psychological in relation to the laws of will be taken for granted. The systemist emergentism (Blitz 1992) is another of the goals incorporated in this theory, quite far away from the holist approach for which there only exist totalities impossible to analyze and hence individual components would be merely illusory or irrelevant. Thereupon, psychological laws,  $L'$ , are rooted in physical laws,  $L$ , but they are not totally reducible to them.

A systemist-emergentist view invites us to describe reality as a hierarchy of structural levels where “structural level” ( $N_i$ ) means a collection of objects or systems that share a certain type of relations and properties. For our purposes we will take on the tetrad  $N = \{N_1, N_2, N_3, N_4\}$ , where  $N_1$  represents the corresponding level for inert matter,  $N_2$  involves the living matter,  $N_3$  includes the living and “feeling” matter—with some development of a neural system—and  $N_4$  encompasses the organisms whose neurosystems lead to the appearance of consciousness (Pomerantz 2008). Each one of these levels is partially inserted in the previous and, as far as we know about, only humans occupy the level  $N_4$ .

The theoretical proposal that will be sketched in the following section presupposes the ordinary logic of predicates with identity, the elementary set theory and all the mathematical tools derived from them. The underlying gnoseology is a realistic one as it accepts that we can know the things in the world outside us, although we can do this indirectly and by means of logical constructions. Thus, in the case of matter as much as mind, our perceptual knowledge is composed of representations [Alemañ 2012] and not of “reflections” of what we perceive.

Another of the basic ingredients in this theory is spacetime in its more fundamental sense, regardless the technical details about metric or affinity. Neither we will enter the controversy on the relational conception of spacetime, that is to say, the possibility to build the concept of spacetime from diverse relations among material systems [Friedman 1991], although the possibility of future enquiries on this issue remains opened to further investigations. Anyway, the acceptance of the spacetime

existence does not prejudice the monist character of the theory, because it applies to the pair “mind-matter” and not necessarily to the rest of elements of reality, in case there exist such elements.

To evade the indictments of metaphysical malformation, we will do without any quotation on properties or relations in themselves. Following partly Aristotle’s view, we will not admit properties without a background substance to which they apply or relations without terms that establish them. In the section 6, nevertheless, we will nearly touch a draft of a possible option to recover the central character of relations in a neutralist ontology.

Finally, our primitive concepts –thus, indefinite– will be only two: the spacetime event,  $e$ , and in a distinct level the qualia,  $q$ . The first of them, elucidated in physical contexts, will be here characterized by its finite size; that is, there will not exist point-events if not as pure abstractions occasionally useful, just like ideal point-particles can be abstracted from a continuous medium. The second primitive will be regarded as a property –emergent in a certain level– that happens to be definitely unanalyzable (“pre-analytic”) and irreducible to any other category. The qualia, as intrinsic qualities of the perceptions linked to the privacy of the individual consciousnesses, are unique for every individual and untransferable even in the psychic context<sup>4</sup>. It is enough to regard them as the sustenance of the internal mental space of any consciousness itself.

## 5. A theoretical outline of neutral monism

Now we will informally build a (mini-)theory in which the previous concepts have a proper place. Our first tenet of existence affirms that the group  $E$  the space-time events,  $e$ , is non-empty, finite, ordered and denumerable. Henceforth we come to our first definition, the “material frame”,  $D = \langle S, L, N, P \rangle$ , as the collection of all series  $S$  of  $e$ , governed by physical laws,  $L$ , with their corresponding levels of integration  $N$ , and their properties  $P$  (emergent or not). It tries to grasp a semi-formalization of the intuitive idea of material world everyone bears on mind. We can proceed likewise with the mental world and then the “mental (or “psychic”) frame”,  $D' = \langle S', L', N', P' \rangle$ , will be given by the series  $S'$  of events  $e$  organized according to psychological laws  $L'$ , with their levels  $N'$  and properties  $P'$ . Notice the series  $S'$  and  $S$ , not the events  $e$ , are the ones that differentiate in virtue of their submission to either the laws  $L$  and  $L'$  or only  $L$ .

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<sup>4</sup> Such as they are used here the meanings of “consciousness”, “mind” and “psychism” will be taken as synonymous for all practical purpose.

In a dynamicist conception of reality, any material system is constituted by a series  $S$  that could be theoretically identified with a 4-dimensional curve (a world-line) and it is therefore subject to changes. All the extant is always mutable and in fact it mutates, although the way the changes happen is ruled by the natural laws. At the same time, as a defining characteristic, all the material systems possess a certain amount of energy, unlike the psychic entities, configured by the series  $S'$ , to which this condition does not apply. Nevertheless, mental processes can be also represented by means of state-spaces as usually done for material processes (Spivey 2007).

In favor of coherence with the established background of scientific knowledge that does not recognize the existence of minds without bodies, we have to add the requirement that every series  $S'$  appears always associated to a unique  $S$ , although the reverse claim is not necessarily true. That is to say, only some series of events among the ones named “matter” can be also regarded as minds from another perspective. After all, the neutrality of this monism does not involve an indispensable co-extensivity between mind and matter. A more formal way to express it would be to claim that among all the collections of events that form orderly series  $S$ ,  $C(e) = \{eS\}$ , there is a subset  $C^*$  whose elements can be arranged as either  $S'$  or  $S$ , in other words  $C^*(e) = \{eSS'\}$ . The same underlying argument was the source of some words from Bertrand Russell (1983, 240):

“(...) within physical space, the thoughts are in the brain. Or, more exactly, each region of the brain is a class of events, and among the events that constitute a region are included the thoughts. It has to be observed that, if we say that the thoughts are in the brain, we are using an ellipsis. The correct formulation is that the thoughts are among the events that, as a class, constitute a region of the brain. That is to say, a determinate thought is a member of a class, and the class is a region of the brain. (...)”

Given all this, where does the very subjectivity of any observer’s mind remain? A response to this question entails to define the “referential bases”, or “perspectival frames”, for both material and mental realm. Just like the balconies used to contemplate the surroundings –where we can address our sight to one landscape or another– these frames enables us to conceive the distinct perspectives with regards to either the material or the mental domain.

In the simplest case, a referential base  $B(S, A)$  in  $D$  would be a material system  $S(e)$  endowed of a chronometric scale,  $A$ ; this is, in other words, what we usually designate as a material frame with a coordinate system attached to it. Such a coordinate system helps a reference frame to describe the development of physical processes governed by the laws  $L$ . On the other hand, a referential base  $B(S', q)$  in  $D'$  would be given by a series  $S'(e)$  together with the qualia,  $q$ , that are typically irreducible properties of the mental activity when it is understood as our most intimate subjectivity. In short, a  $B'$  is what we usually call “a mind”.

The differences between both types of referential bases are wide and deep. It is broadly regarded that a base  $B$  offers us an objective view from which we can investigate the structures of the physical world. Ideally, the properties and interactions of the material system  $S(e)$  would be irrelevant for our purposes insofar we only need to focus on the four space-time axes in order to mathematically label the event  $e$  and assemble them in the series commonly known as worldlines.

Moreover, the  $B$  frames can freely move through spacetime providing us with perspectives of reality which structural features remain linked by groups of algebraic transformations. We can even overlap two or more of these bases by means of displacements. In this case it could be regarded as a “deindividuation” of the referential frame since when two of them become the same when superimposed. From a more subjectivistic point of view, we would say that infinite observers could share the same  $B$  and obtain the same perspectives of reality.

But bases  $B'$ , nevertheless, are constructed by means of qualia and, in consequence, they are fully subjective. These  $q$ , taken as emergent properties in  $D'$ , set up the representations of the external and internal worlds that the self handles. The fact that the  $q$  depend on both external perceptions and introspections guarantees that there will never be a perfect identity between the  $q$  of distinct  $B'$ , since in material configurations of such complexity like organisms with sufficiently developed neurosystems, an absolute equality in all structural details will never come about (Turausky 2014).

There is not a proper comparison between the qualia of distinct bases  $B'$  (distinct minds, in the common language), given their essential character of intrinsic and untransferable qualities, and therefore it can neither exist a superposition between them, as different from the case of  $B$ . We are now dealing with a principle of “absolute

individuation”, for want of a better term, exclusive of the  $B'$  in  $D'$ . Then, what prevents all the observers from remaining isolated in their own mental interiority, like an archipelago of solitary islands in the middle of an unattainable universe?

The answer resides in the perceptual spaces (fundamentally the visual space, although the auditory and tactile ones also influence), internally built from the respective qualia of every individual but also able to reproduce structural features of the external world, features homologable among diverse observers (Zaidi *et al.* 2013). And that homologation happens to be possible due to the fact that perceptions occur by means of structurally-standard sensory channels common to all the human beings<sup>5</sup>. That our perceptions provide us with a picture of the external world that is roughly true in some regards can hardly be a surprise when acknowledging that they evolved in response to the survival needs of our most remote ancestors (D'Andrade 2003).

My visual space, in its basic details, coincides with the one of another observer as much as we get closer to each other, and something similar happens with the auditory space, so that they enables us to obtain reliable estimates –to some extent– of distances and positions. The intersubjective comparison of these estimates, together with a number of experiments and rationally-controlled abstractions finally lead us to the concept of external world with all its content and properties.

## 6. Some additional considerations

A first remark to put forwards points to the fact that this theoretical outline of the neutral monism does not have a normative character, but only a descriptive one. There are here neither laws of evolution nor any other kind of prescriptions. It could not be other way since we are not in the field of the natural or social sciences. Any ontological approach designed to embrace existential problems has to agree with the firmly established scientific knowledge as long as it does not wish to quickly fall in obsolescence, irrelevance or nonsense. Therefore it is enough for the neutral monism to be compatible –as it is in fact by construction– with the physical and psychological laws, which remain subsumed in that proposal without alteration or reduction.

Secondly, this is only one of the many possible formulations for neutral monism which is, by the same token, susceptible to change in order to take in the knowledge progresses. The very notion of event  $e$  –assumed here as primitive– is elucidated in a

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<sup>5</sup> Which perceptual spaces and which representation of the world would aliens build with distinct sensory receptors? Nothing we can say by now in this regard because of the lackness of any data.

physical context by means of the spacetime concept, so that any advance in the latter will simultaneously produce a conceptual enrichment of the other. Of course, this does not justify an unconditional support to the bizarre peculiarities of the new versions of panpsychism, animism or even occultism championed by those authors who appeal to quantum physics –for example– to present the most outlandish irrationality disguised as forefront science.

The choice of the events  $e$  as indefinable elements in this theory does not mean to renounce, in principle, to the research of a relational ontology for reality. The physical concept of “event” –as the concept of “state change”– presupposes the notion of “concrete thing” in which that aforementioned change occurs. To simplify, we will express the concept of change as a relation  $R$  between a thing in a previous state  $a_1$  and its subsequent state  $a_2$ ,  $e = Ra_1a_2$ . Now, instead of only focusing on  $R$  and forgetting about its terms, we could conceive a concrete thing in a generic state,  $a^*$ , as the complex of all its relations,  $a^* = C_x(R_i)$ . In this case we would have that  $e = RC_x(R_i)$ , although this step entails to regard entities as the bundles of their binding relations, reflexive (pointing to themselves) and projective (pointing outside), dimming the distinction between substratum and properties, an attempt which is neither simple nor beyond controversy.

The premises of the theory can certainly be altered but always respecting the global congruence. The most notorious case of this is the tenet that the series  $S$  and  $S'$  must be composed of the same events but organized according to distinct laws,  $L$  and  $L'$ . It is due to the irrefutable evidence that the same minds happen to be always linked to the same brains<sup>6</sup>. But we could wonder about the consequences to weaken this requirement, what would lead us to define the mind as the pair  $\langle S', S \rangle$ , in which the series  $S'$  and  $S$  would be formed by distinct groups of events,  $e_i$  and  $e_j$ . In this sense the comments of Bertrand Russell on the possibility of minds detached from any material support can be understood. In his opinion, there could exist an incorporeal mind “(...) if there exist groups of events, connected according to the psychology laws and not connected according to the physics laws” (Russell 1960, 145), although he also acknowledged the absence of empirical evidence in this regard.

However, the aforesaid Russell’s statement also considers the physical and the psychological laws as if they were entirely independent, violating the emergentist

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<sup>6</sup> The lucubrations of Rupert Sheldrake (2011) on “morphogenetic fields” and “morphic resonances” –a deformed echo of the jungian collective unconscious– that deny this statement lack of the weakest favorable proof although that author refuse to admit it.

systemism which the version of neutral monism presented herein is built on. If we admit that the biological and psychological laws rule emergent properties arisen in successive levels of complexity, it will be impossible to forget that the foundations of both types reside in the realm of physics, which all laws have to fundamentally agree with. That is why the situation becomes quite more subtle than Russell suggested, as we would need an extraordinarily overwhelming empirical evidence to modify the physical laws for the acceptance of such incorporeal minds (or, strictly speaking, multi-corporeal). Needless to say that we absolutely lack of those proof so far.

## **7. And what about consciousness?**

Although the issue we are dealing with is not primarily involved with the problem of consciousness, such a prominent dimension of the human mind stands in need of at least a brief discussion. There have been so many and diverse approaches over years, upheld by the recent development of cognitive neurosciences, and all *prima facie* with valid arguments, that any attempt of originality on this question seems to be both needless and risky. Its distinctive characteristic no doubt roots in a boundless self-referential capacity, an infinitely recurrent self-transparency that constitutes the nuclear core of the human identity. This inherent subjectivity is what comes about to be immensely difficult –if not impossible– to objectify in order to find for it an explanatory mechanism. Even the very word “mechanism”, as a causal process in a material system, hardly fits with the irrevocably subjective level of the human consciousness. That is why it is so easy to get lost in a jungle of categorial errors even when only trying to outline this enquiry.

One of the more conspicuous defenders of the irreducibility of human consciousness has been the British Sir Roger Penrose, who ascribed the specific features of human minds not only to qualia but also to the non-algorithmic nature of some mental processes. This non-algorithmic, or non-computable, character concerns to the problems whose solution is unattainable just by following a finite list of instructions. Any result that cannot be obtained by means of a finite series of steps is said to be non-computable. In this point it is used to mentioning the Goedel’s theorem of incompleteness which states that any finite system of axioms can generate propositions whose veracity we understand although we are also unable to prove it, unless we increase the number of axioms. That increase would generate new indemonstrable propositions in an endless competition against our own algorithmic impotence.



Penrose has claimed either the plausible implication of non-algorithmic physical processes (non-local correlations in the collapse of the quantum state function) in the origin of our consciousness in a cerebral level. And although his opinion received a real landslide of criticisms, it has at least had the virtue to address the general attention to the need of a new physical description for the phenomenon of consciousness. It seems neither wild nor reckless to guess that in such a complex system as our brain both quantum phenomena (Abbott et al. 2008) and non-linear effects derived from the neural multiconnectivity (Carsetti 2010) play a significant role.

Anyway, though we should identify a cerebral process correlated with the introspections called “self-consciousness” –or “oneself’s acknowledgement”– it would be still doubtful to plausibly grasp the self-referent content of those introspective experiences (Globus 2009). And it is doubtful because scientific knowledge is essentially objective, that is to say, it deals with the structural features of reality but, by the same token, it can say nothing on irreducible subjectivities as the intrinsic qualities of our perceptions –the qualia– or our internal self-transparency, elements that in some extent seem to be ontologically primary. Perhaps it is just an endeavor that will ever remain beyond our methodological scope (Sorem 2010).

## **8. Conclusions**

After the previous discussions we can conclude that it is possible to construct –at least tentatively– a concrete theory on the mind-matter relation from the point of view of the neutral monism where these two categories are but partial domains of an underlying reality, domains that arise depending on the structural filter chosen to contemplate the world. Unlike the still-fashioned materialism, the neutral monist view does not concede primacy to matter over mind while facilitating to address so prickly questions as the irreducible character of the human consciousness in the usual terms of the scientific explanations. Taking the space-time event or any entity else as the basic element of this approach has to be decided by theorists.

The difference between objectivity and subjectivity as necessary ingredients in an complete picture of reality shared by mind and matter –because, definitely, what is known is always knowledge of someone– finds a natural place in this theory by means of the notions of “(material or mental) referential bases”. Another main component of the present proposal is the emergentist systemism, where each level of complexity and its corresponding laws are partially founded on the precedent level.

In one of such emergent properties there lies the existence of qualia, the intrinsic qualities with which we experience the outer world and our own inner privacy. Along with qualia, self-consciousness and the mind's non-computability –all those issues could be plausibly interconnected– might rise like unbeatable walls in our path towards the understanding of our deepest mental life.

One way or another, any philosophical proposal that aspire to have a minimum degree of credibility has to agree with the master lines of what we could loosely name the scientific cartography of reality. And in this commitment a delicate balance must be faced: on one we have to respect the limitations of our own methods and formalisms while on the other hand these same formal instruments encourages us to widen the epistemological borders whose outlines we can hardly glimpse. And although we do not know which of these two conflicting tendencies will win, the truth is that we cannot refuse to fight the battle.

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